

CBCS SCHEME

21CS752

Seventh Semester B.E./B.Tech. Degree Examination, June/July 2026 Introduction to AI and ML

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is Artificial Intelligence? List and explain foundations of Artificial Intelligence. (10 Marks)
- b. Explain the following:
 - i) Turing Test Approach
 - ii) Cognitive Model Approach
 - iii) Laws of Thought Approach
 - iv) Rational Agent Approach
 (10 Marks)

OR

- 2 a. Demonstrate with a neat diagram how agents interact with environments through sensors and actuators. (05 Marks)
- b. Discuss about nature of environment with an example. (07 Marks)
- c. Explain structure of the agents and its types. (08 Marks)

Module-2

- 3 a. List and explain the phases of problem-solving process and well defined problems and solutions. (08 Marks)
- b. Discuss the Breadth first search and depth first search algorithm with an example. (12 Marks)

OR

- 4 a. Discuss about heuristic function of greedy best first search. Apply GBFS to find out the most cost effective path from state A to goal state G. (10 Marks)

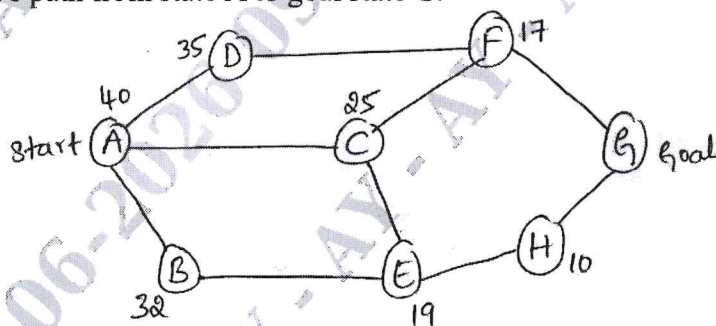


Fig.Q.4(a)

- b. Apply A* algorithm to find out the most cost effective path from start state A to goal state G. (10 Marks)

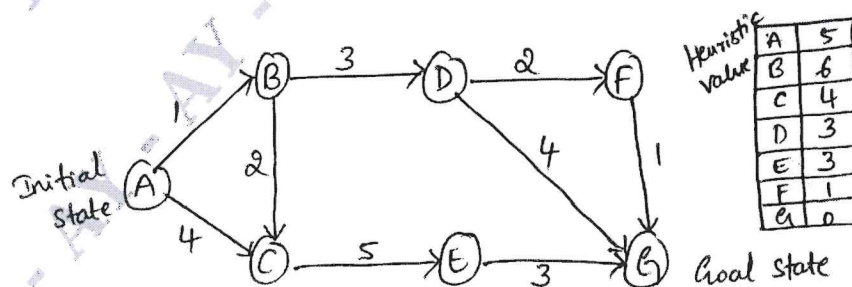


Fig.Q.4(b)

Module-3

- 5 a. Define Machine Learning. Summarize how machine learning is linked to AI, data science and statistics. (07 Marks)
 b. Discuss the types of machine learning with examples. (08 Marks)
 c. Explain the Machine Learning Process Model. (05 Marks)

OR

- 6 a. Define Data. Discuss the types of data and data storage and representation of data. (07 Marks)
 b. Describe Big data analytics and types of analytics in detail. (06 Marks)
 c. Explain the Big data analysis framework. (07 Marks)

Module-4

- 7 a. What is Bivariate and Multivariate? Discuss Bivariate and Multivariate statistics with examples. (10 Marks)
 b. Define Probability Distributions. Explain the types of probability distributions. (10 Marks)

OR

- 8 a. Write find-s algorithm. Apply the find-s algorithm for the training dataset of 4 instances as shown below, which contains the details of the performance of students and their likelihood of getting a job offer or not in their final semester.

CGPA	Interactiveness	Practical knowledge	Communication skills	Logical thinking	Interest	Job offer
≥ 9	Yes	Excellent	Good	Fast	Yes	Yes
≥ 9	Yes	Good	Good	Fast	Yes	Yes
≥ 8	No	Good	Good	Fast	No	No
≥ 9	Yes	Good	Good	Slow	No	Yes

(10 Marks)

- b. Differentiate between instance-based learning and model-based learning. (05 Marks)
 c. Explain K-nearest neighbor learning algorithm. (05 Marks)

Module-5

- 9 a. Explain the structure of an ANN with a neat diagram. Discuss about the types of ANN. (10 Marks)
 b. Write a short note on Perceptron Model. (05 Marks)
 c. Write Perceptron Algorithm. (05 Marks)

OR

- 10 a. Discuss a learning in a multi-layer perceptron algorithm with forward and backward propagation. (10 Marks)
 b. Explain radial basis function neural network. (10 Marks)
